

Forestry BMPs & Water Quality



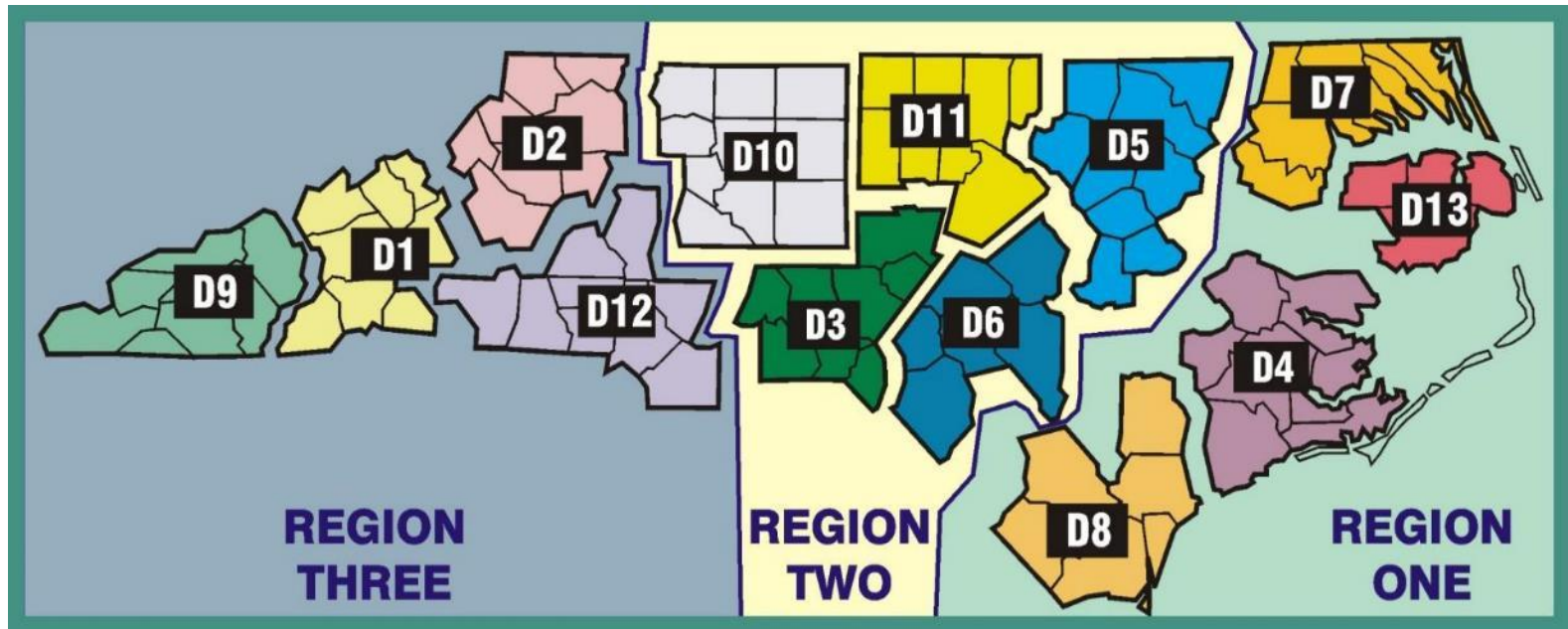
***Soil & Water Conservation Districts of NC
District Employees Training Series: Feb. 2021***

***Tom Gerow, Jr. -- RF, CESSWI
Water Resources Staff Forester***

www.ncforestservice.gov



N.C. Forest Service Organization



*Division of NCDA&CS. An office to serve each County.
Consultation...Education...Prevention... before Regulation.*

**Fire Control... Reforestation... Forest Health Monitoring...
Prescribed Burning... Forest Management Planning Services...
Urban Forestry... Education... **Water Quality** ... Forest Inventory...
Emergency/Incident Response.**

NCFS Water Quality Actions

Forestry Site Inspections & Assessments

- Compliance inspections
- BMP monitoring
- Respond to complaints
- Inspect cost-share projects



Technical Assistance & Training

Stream Restoration on State Forests

Learn More: www.ncforestactionplan.com

Forestry BMPs

Focus: water quality & soil conservation (nonpoint source pollution)

Even when forestry BMPs are used, the logging job may appear “messy” to the un-trained eye.

BMPs can be tangible things = *What You Do*:

- Streamside Management Zones
- Brush on skid trails... Bridgemats... Seed/Straw...
- Waterbars / Turnouts / Rolling Dips / Diversions / Wing Ditches

BMPs can also be a “process” = *How You Do It*:

- Timing, equipment... layout of skid trail or road... # of decks
- How and When was the tract logged? Was soil dry?
- Was the SMZ flagged or painted?
- Were roads built beforehand with a plan, or pushed in on-the-fly?

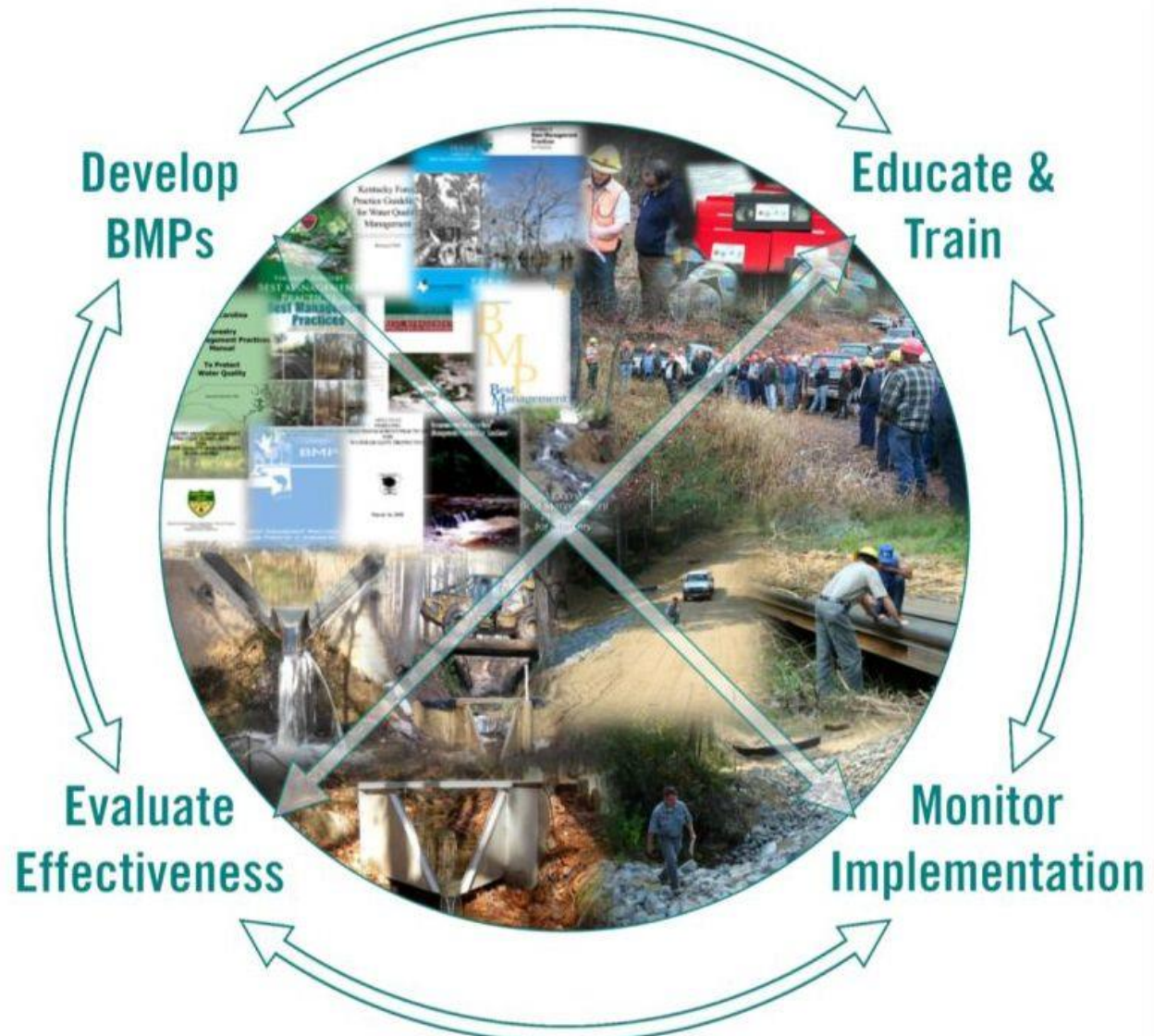
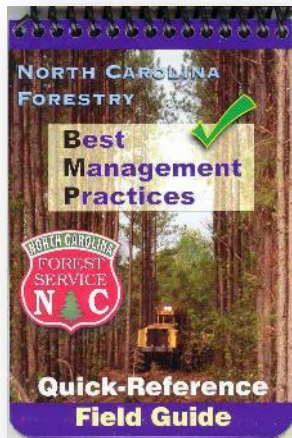
Forestry BMPs

North Carolina

Forestry
Best Management Practices
Manual

To Protect
Water Quality

Amended September 2006



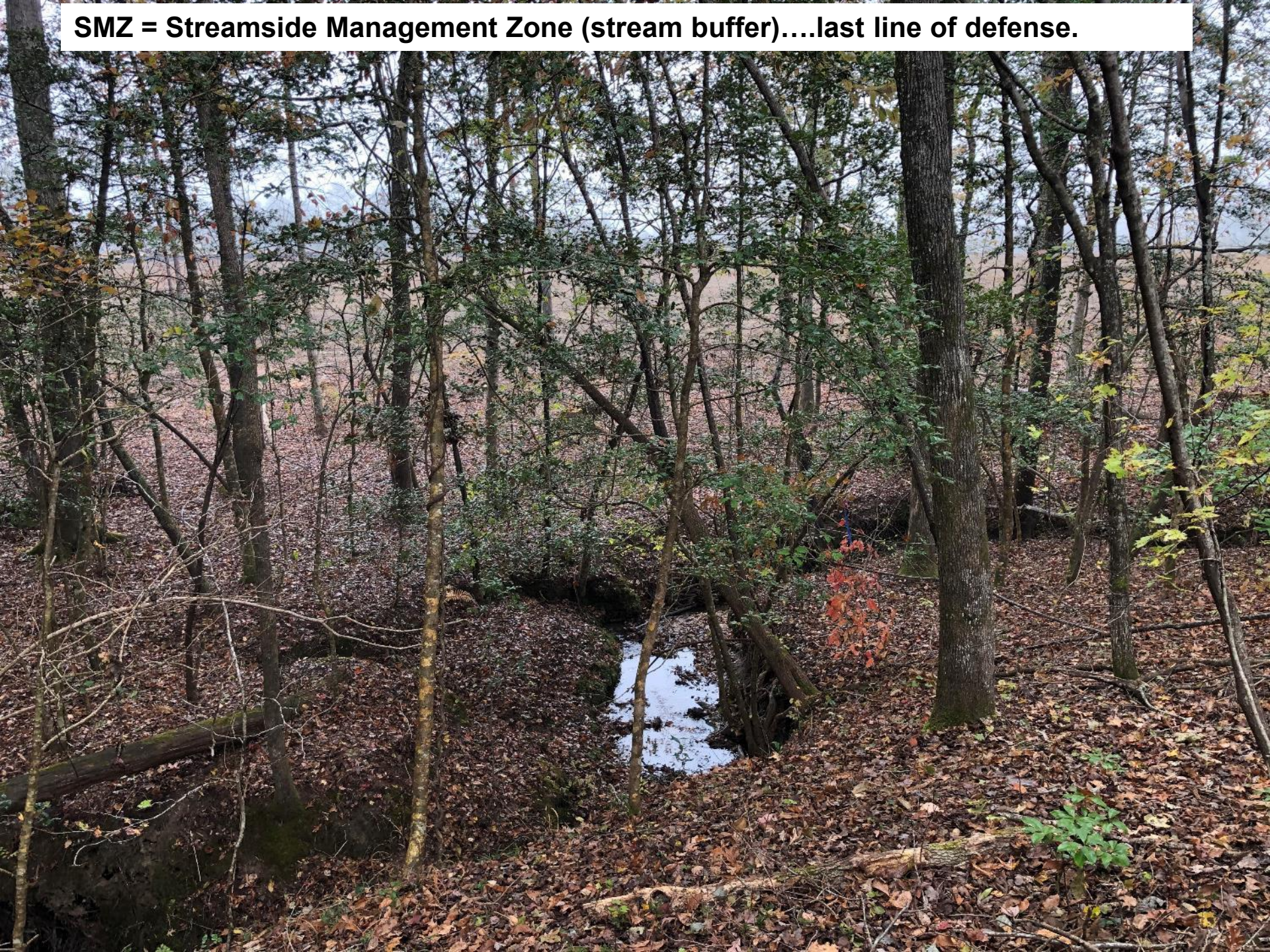
**Steel bridgemats for a stream crossing.
(timber mats can also work)**



Skid trail with logging slash brushed-in.



SMZ = Streamside Management Zone (stream buffer)....last line of defense.





**Waterbar: diagonal
'speed bump', to
divert runoff.**

**Rolling Dips: gradual
humps on a road or skid
trail, to divert runoff.**



Broad-Based Dip. Collect and divert runoff from forest roads.



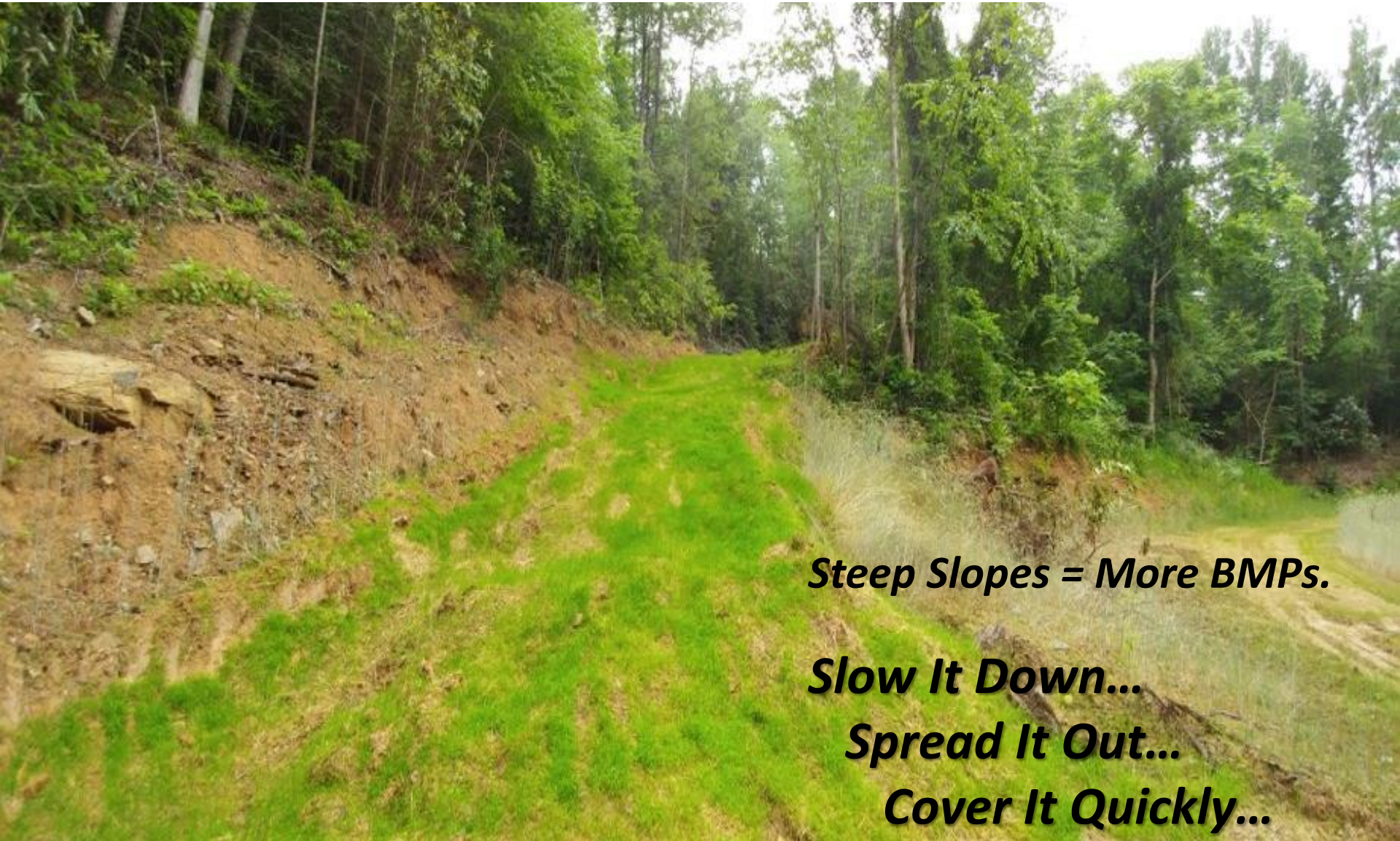
Stream crossing stabilization: seed & straw....



Stream crossing stabilization: logging slash/debris...



Stabilization of critical soil areas upon completion.



Steep Slopes = More BMPs.

Slow It Down...

Spread It Out...

Cover It Quickly...

Road pallet mats, minimize track-out



In the Swamp: use the 'shovel logging' method.



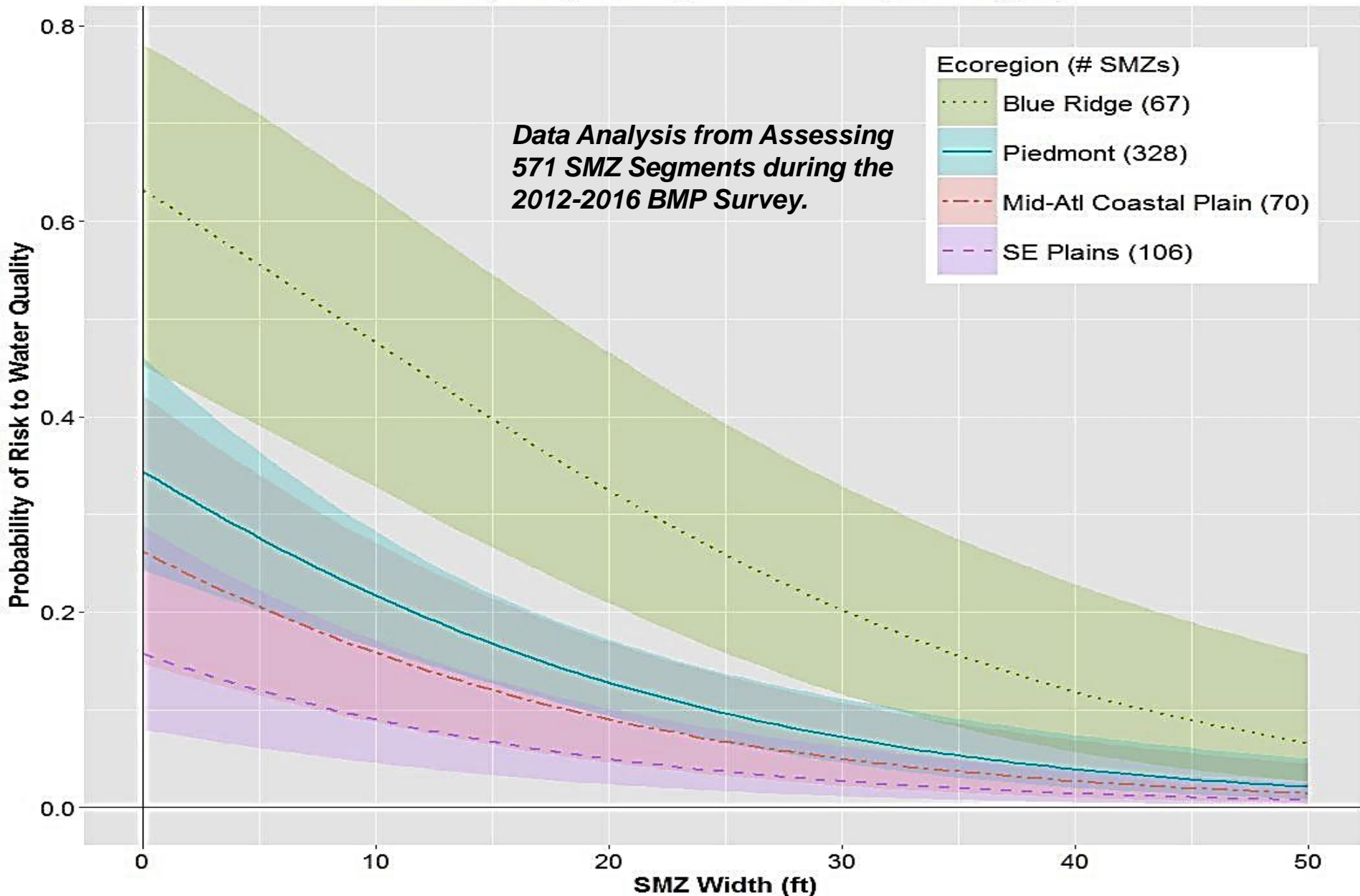
Forestry BMPs: Monitoring

BMP Implementation Monitoring Surveys

- Recurring statewide randomized site assessments.
 - Are applicable BMPs used?...Are they functioning?
 - Past: mid-80% statewide, with regional fluctuations.
 - Follow a sampling protocol shared in southern states.
-
- ✓ Completed 4th cycle BMP survey field visits (2018-2020).
 - ✓ 200+ sites assessed...10,000's of BMP data points.
 - ✓ Using USLE to estimate soil erosion on 200+ stream crossing approachways.

Forestry BMPs: Monitoring

Water Quality Risk by SMZ Width (with 95% CI)



Forestry BMPs: Other Resources

- Loan portable bridgemats to loggers.
- Web-based Preharvest Planning Tool.
- ProLogger, college courses, & other training.
- Quarterly statewide BMP newsletter.
- Engage with researchers, stay up-to-date.
- Videos, guides, culvert sizing tool, leaflets, demonstration areas...



Forestry BMPs: Research



Forestry BMPs: Research



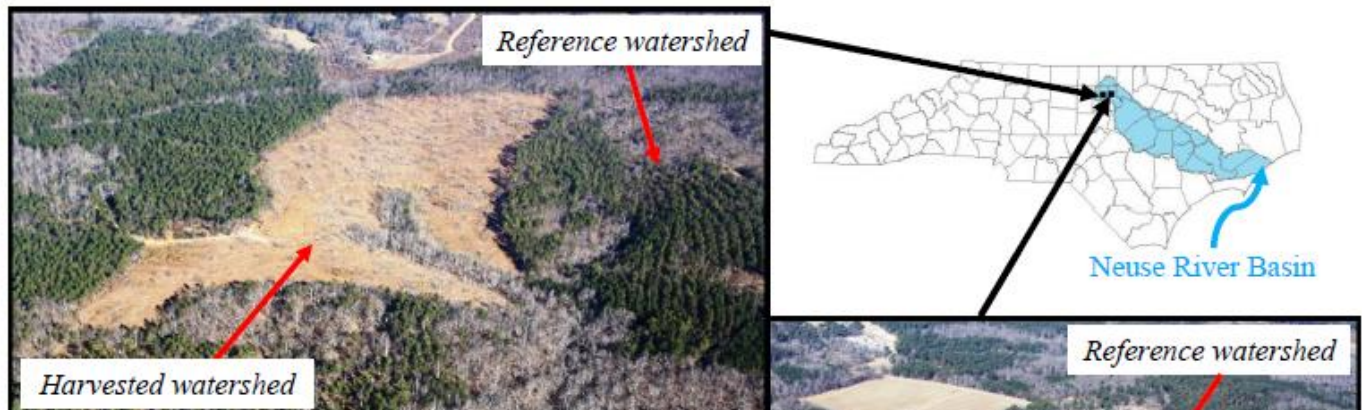
Timber Harvesting Effects on Water Quality and Quantity in the Headwaters of the Neuse River Basin

A snapshot of a long-term paired watershed study results



What We Did

- The North Carolina Forest Service completed and published a non-technical summary of a 6-year (2007-2012) paired watershed research project that evaluated the effects of timber harvesting on water quality and quantity in two headwater stream systems of the Neuse River Basin in North Carolina.
- Timber harvesting complied with the Forest Practice Guidelines Related to Water Quality (FPG's) and Neuse Buffer Rule. Additionally, the timber harvest followed appropriate voluntary forestry best management practices (BMPs) to help protect water quality.
- The non-technical summary distilled technical results into “take-home points” for forest management.



BMPs & Forestry Certification

“The reality is that worldwide environmental concern is resulting in a demand from governments, businesses, and consumers for verifiable, credible information on the environmental impacts of products and services.”

*Excerpted from Report Entitled “Environmental Product Declarations: What? Why? How?”
October 30, 2012. By Wayne Trusty. Published by Dovetail Partners Inc. www.dovetailinc.org*



- Private-Sector, Market-Driven, Consumer-Demand.
- Independent, 3rd-Party Audits... chain of custody...
- Raw Material Procurement and Land Management.
- Member subscribers agree to sustainability principles:
 - Follow BMPs, above & beyond what rules say.
 - Use trained professional loggers & raw material suppliers.
- Member has a vested interest. (\$\$ and goodwill)

Transition...



Forestry Water Quality Alphabet Soup

SPCA: forestry-related, land-disturbing activities are exempt from plan / permitting, as long as that activity meets the standards of the *Forest Practice Guidelines Related to Water Quality* (FPGs).

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FPGs: 9 required narrative standards, 02 NCAC 60C .0100 to .0209

- Enacted 1990, Re-Adopted 2018. Apply statewide.
- NCFS is the lead agency, conducting 6,000-7,000 inspections annually statewide (about 50/50 split *Initial* vs *Re-Inspection*).
- Interagency protocols for handling non-compliance issues.

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BMPs: non-regulatory management measures

- Minimize non-point source pollution.
- North Carolina Forestry BMP Manual & Field Guide.
- ‘tools in the toolbox’ to achieve FPG compliance.
- Incorporated / Institutionalized in forest certification programs.



Forest Practices Guidelines - FPGs

02 NCAC 60C .0100 to .0209:

- .0201 – Streamside Management Zone (SMZ)**
- .0202 – Prohibition Debris Entering Streams / Waterbodies**
- .0203 – Access Road and Skid Trail Stream Crossings**
- .0204 – Access Road Entrances**
- .0205 – Prohibition Waste Entering Streams, Waterbodies and Groundwater**
- .0206 – Pesticide Application**
- .0207 – Fertilizer Application**
- .0208 – Perennial Stream Temperature**
- .0209 – Rehabilitation of Project Site**

*See NCFS online
“Forestry Leaflet #WQ-1”.*

Forest Practices Guidelines, FPG .0201

- (a) A streamside management zone (SMZ) shall be established and maintained along the margins of intermittent streams, perennial streams and perennial waterbodies. The SMZ shall confine visible sediment resulting from accelerated erosion.**
- (b) Ground cover, or best management practices, within the SMZ shall restrain accelerated erosion.**
- (c) Access roads, skid trails, [except at crossings], logging decks and mill sites shall be placed outside of SMZs. When barriers such as property lines or limiting land features prohibit the location of any of these outside of SMZs, they can be located within the SMZs. When located within SMZs, there shall be effective erosion control and sediment control structures or measures installed to restrain accelerated erosion and prevent visible sediment from entering intermittent streams, perennial streams or perennial waterbodies.**

BMPs are the tools that can be used to comply with FPGs.

BMPs for Streamside Management Zone (SMZ)



Some Example BMPs:

- 50-feet wide is the general BMP recommendation.
- Wrap the end of SMZ around head of stream, into Ephemeral transition area.
- Limit harvesting of trees if acceptable to landowner / buyer / logger.
- Retain at least 50% of shade.

NCFS Inspection Process

- Locate logging jobs.
- Inspect for FPG compliance.
- High priority, especially active sites.
- Robust Policy & Procedures, and internal operating guidance.
- Timeframes and recommendations to resolve noncompliances.
- Use market-based forest certification leverage to resolve noncompliances.
- If necessary, make interagency Referral for potential enforcement action.

4856-1
12/2007

FOREST WATER QUALITY SITE INSPECTION & COMPLIANCE NOTIFICATION FORM ("Form 4856-1")
NCD&CS - North Carolina Forest Service (NCFS)

District: _____ County: _____
Riv./Fwd: _____ Tract ID #: _____
Lat: _____ Long: _____

1. INITIAL CONTACT INFORMATION

NCFS Person Receiving Info: _____ Date Information Received: ____/____/____
Source of Information: ☐ NCFS ☐ DNR ☐ DWR ☐ Citizen Complaint ☐ Other: _____
Describe Site Location, Type of Operation & Observations: _____

2. INVOLVED PARTIES

Logger or Forest Operator: _____ Timber Buyer: _____
Landowner(s): _____ Owner's Consultant, Agent, or Representative: _____

3. SITE EVALUATION

☐ Active Forestry Operation ☐ Inactive Forestry Operation Est. Days Since Closeout: _____ Est. Acres: _____
☐ Final Harvest ☐ Thinning Site Usage Type: _____ ☐ Site Prep ☐ Other: _____
Names of Persons Contacted On-Site: _____
On ____/____/____ this forestry operation was inspected for compliance with the NC Forest Practice Guidelines ("FPGs"), and/or applicable riparian buffer rules, and/or other water quality rules. It was determined:
☐ This forestry operation is currently In-Compliance with Forest Practice Guidelines Related to Water Quality (FPGs).
☐ This completed forestry operation is in Temporary Compliance with the FPGs, pending vegetative groundcover growth.
☐ This forestry operation is Out-of-Compliance with the FPG standards checked below:
☐ 0201 Streamside Management Zone ☐ 0204 Access Road Practices ☐ 0207 Fertilizer Application
☐ 0202 Stream Obstructions ☐ 0205 Prohibition of Waste ☐ 0208 Stream Temperature
☐ 0203 Road/Skid Trail Stream Crossings ☐ 0206 Pesticide Application ☐ 0209 Rehabilitation of Site
☐ If this box is checked, then this site has a Violation of either:..... ☐ G.S. 77-13 or ☐ G.S. 77-14

CORRECTIVE ACTION(S) NEEDED: _____ **REQUIRED COMPLETION DATE:** ____/____/____

This site will be re-inspected after the Required Completion Date to determine if sufficient corrective action(s) have been taken to achieve compliance. If all conditions restrict you from completing the Corrective Actions, you may request a time extension by calling the N.C. Forest Service employee at this number: _____. A limited extension may be granted, based on past performance and potential risk to water quality.

☐ If THIS BOX IS CHECKED, then we are required to notify the appropriate state environmental agency(ies), thereby making a Water Quality Referral due to a potential risk to water quality or environmental conditions. See letter and Site Summary Report.

4. ADDITIONAL OBSERVATIONS

During the site inspection it was observed that this forestry operation is potentially in violation of water quality rules associated with the following topic (If a box is checked below). We may be required to notify a state environmental agency. See accompanying letter.
☐ Riparian Buffer Rule ☐ Wetlands Rules ☐ Other: _____

Inspector's Signature: _____ Date: _____

More Explanation Available on our Website...

NCFS Inspection Results

(does not include follow-up Re-Inspections)

State FY (July 1 to June 30)	Total Timber Harvest Inspections	# Out of Compliance	Reforest & Other Activity Inspections	# Out of Compliance	# of WQ Referrals (FPG + Buffers)
2019-20	3,208	34	282	4	17: (3+14)
2018-19	2,780	46	344	1	17: (8 + 9)
2017-18	3,172	47	365	0	4: (0+4)
2016-17	2,937	64	310	0	8: (3+5)
2015-16	3,538	63	385	2	18* : (1+17)
2014-15	3,590	62	457	0	n/a
2013-14	3,570	70	549	3	n/a

* Numbers starting Oct.2015

For FPGs....Is It Forestry?

Not all tree-cutting / logging is for forestry purposes.

The FPGs and forestry BMPs only apply to “forestry-related” (silviculture) activities.

If purpose & intent of logging is not clear:

1. NCFS + DEQ-DEMLR joint site visit/consultation.
2. DEMLR decides. We work with DEMLR, not local E&SC programs.



For FPGs....Is It Forestry?

...(no)...



Forestland Conversion to Ag?

NCFS should not inspect for FPG compliance.

If a BMP/water quality concern is observed by NCFS:

- 1. Write letter to landowner, noting concerns and offer forestry BMP recommendations, and advise them to contact local S&WCD.**
- 2. Send courtesy-copy of letter to local S&WCD.**
- 3. (Note: If NCFS sees a potential violation of a DWR Buffer Rule, then we will notify DWR.)**
 - Ag ponds are exempted...but not streams if converting from woodland to ag land.



(stream)





How to Help...

If Converting Woodland to Ag-Land:

Recommend they use tried & true forestry BMPs, at least during the transition phase when lots of terrain is exposed.

Keep an effective woody vegetated buffer on streams (small trees and shrubs... pollinator habitat...?).

Promptly stabilize critical bare soil areas.

Get to know your County Forest Rangers.

Reforestation assistance (tree seedling sales / cost-share)...
forest management plans... pre-harvest advice... burn permits...
forest health concerns... yard-tree/urban forestry assistance.



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Nursery

High quality tree seedlings available

Adequate supply of seedlings available for early planting from the North Carolina Forest Service Nursery

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[NPDES Pesticide General Permit](#)

[Water Quality Forestry Leaflet 1, Forestry Practices Guidelines Related to Water Quality \(PDF\)](#)

[River Basin/Watershed Riparian Buffer Rules](#)

Best Management Practices

[BMP Material Costs](#)

[What are BMPs?](#)

[Difference Between FPGs & BMPs](#)

Hot Topics

- [January 2021 Newsletter](#) - Forestry Best Management Practices Basics
- [Download](#) - Topographic and Soils Maps for Riparian Buffer Rules
- [Online Preharvest Planning Tool](#)
- [Annual Water Quality in Review](#)

Water Quality Refresher Presentations

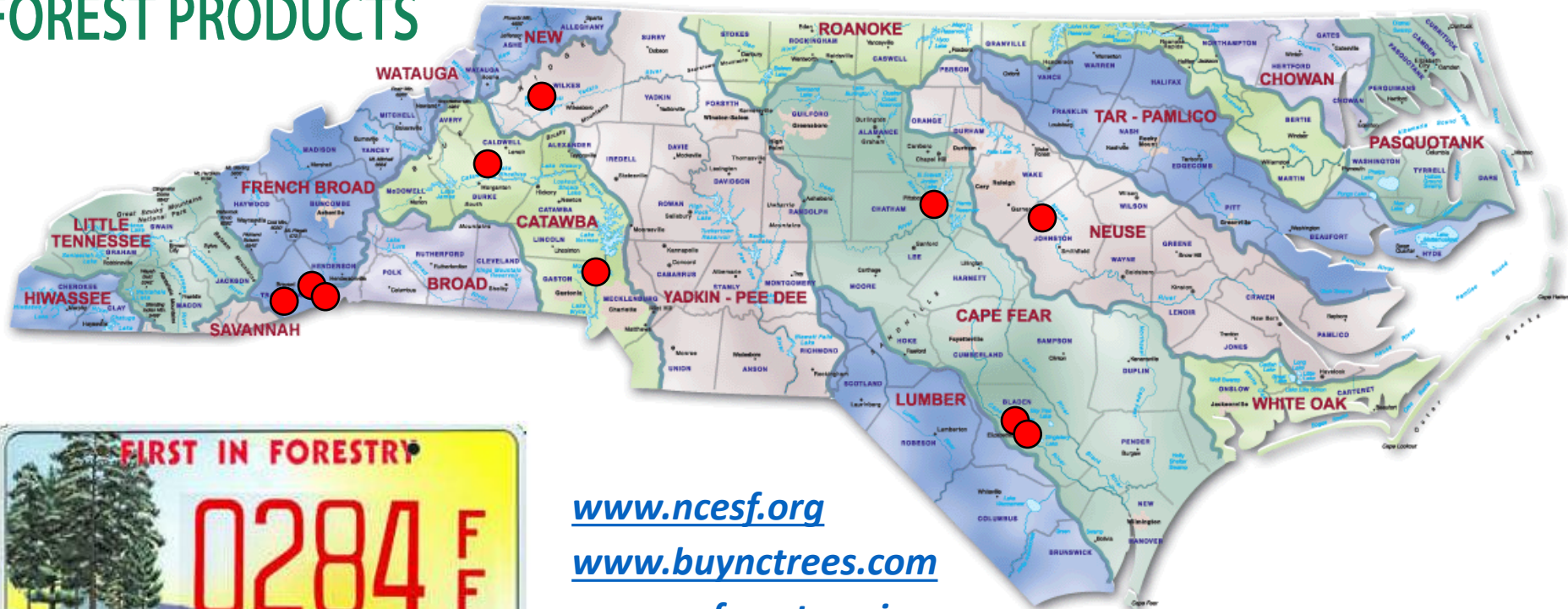
- [Part 1: Rules](#)
- [Part 2: Streams](#)
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Quick Links

[My Woodland Plan](#)

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State Forest Locations



www.ncesf.org

www.buynctrees.com

www.ncforestservice.gov

HEALTHY FORESTS = CLEAN WATER



Use Best Management Practices